Applicant : Brandon A. Bartling
Serial No. : 10/743,585
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Art Unit: 1745
Examiner: Gregg Cantelmo

## REMARKS

Claims 1-3, 5, 6, 8-20, 22-24, 26-29, 31 and 32 remain in the application. Reconsideration of claims 1-3, 5, 6, 8-20, 22-24, 26-29, 31 and 32 is respectfully requested.

In the Office action mailed March 19, 2007, the Examiner approved the revised drawings and withdrew the objection to the drawings in light of the replacement drawings submitted and withdrew the previous § 112 rejections in light of the amendment submitted on March 5, 2007. The prior art rejections were maintained. Claims 1-3, 6-10, 12, 14-17, 19-20, 22-24, 26 and 29-31 were rejected under 35 USC § 103(a) as obvious over Oltman et al. in view of WO 01/91224. Claims 18, 27-28 and 32 were rejected under 35 USC § 102(b) as anticipated by or, in the alternative, under 35 USC § 103(a) as obvious over Oltman et al. in view of WO '224. Because of discrepancies between the disposition of claims, as listed on Form PTOL-326 and in section 1.a. of the Detailed Action, and the details of the claim rejections in the Detailed Action, the reasons for the rejection of each individual claim remaining in the application is not clear. However, the prior art rejections are traversed for the reasons presented below, as applied to independent claims 1, 19, 23 and 29.

The Examiner also indicated that, in considering patentability of the claims under 35 USC § 103(a), the subject matter of the various claims was presumed to have been commonly owned at the time any inventions covered therein were made, absent any evidence to the contrary. The undersigned confirms that the subject matter of all claims was commonly owned at the time any inventions covered therein were made.

Independent claims 1, 19, 23 and 29 were rejected under 35 USC § 103(a) as obvious over Oltman et al. in view of WO '224. Claim 1 of the present application recites a metal-air cell comprising at least one air entry port along an exterior surface of the cell, a tab system that covers the at least one air entry port, and zero added mercury. The tab system comprises at least a first polymer layer and an adhesive layer disposed between the exterior surface of the metal-air cell and the polymer layer. The tab system has a loss stiffness from about 25,000 to less than about 55,000 N/m at 20°C to 25°C and an oxygen permeability from about 50 to about 150 ($cm^3$ x m x mm Hg) / ($m^2$/day). Claims 19, 23 and 29 recite cells that have loss stiffness and oxygen permeability values within the same ranges as recited in claim 1. Claims 19, 23 and 29 further

require that the tab system has an average burst pressure from about 43 to 60 psi, and claims 23 and 29 further require that the tab system has a peel strength from about 6.5 to about 11 psi.

Oltman et al. disclose a metal-air cell comprising at least one air entry port along an exterior surface of the cell and a tab system comprising a biaxially-oriented polypropylene paper and an acrylic adhesive disposed between the paper and the exterior surface of the cell. The Examiner has taken the position that, because the Oltman et al. biaxially-oriented polypropylene paper/acrylic adhesive combination appears to be substantially identical to at least some of those exemplified in the present application, there is a reasonable expectation that the prior art paper of Oltman exhibits the same loss stiffness, peel strength, oxygen permeability and average burst pressure as the present invention. The Examiner also concluded that because Oltman et al. make no mention of the presence of mercury in the product, it is not expected to have any mercury therein.

Applicants had previously argued that the prior art metal-air cell does not necessarily or inherently posses the characteristics of the claimed cell. In support of this argument, a Rule 1.132 Declaration was submitted showing a tab system used on cells sold by Rayovac, the Assignee of the Oltman et al. patent had loss stiffness, peel strength and average burst pressure values outside of the ranges recited in claims 1, 19 and 23 (as well as claim 29). The tab system on the Rayovac product, like the tab system disclosed by Oltman et al., had a biaxially oriented polypropylene face stock/first polymer layer, a plastic film on one surface of the face stock layer, and a removable acrylic adhesive on the opposite surface of the face stock layer. The Examiner considered this evidence but concluded that it was insufficient. The Examiner's reasons were that the Declaration failed to provide a side-by-side comparison between the claimed invention and the invention disclosed in the Oltman reference, there was nothing to support Applicant's assertion that the comparative product would be the same as that in Oltman, and the Assignee has numerous prior art disclosures related to the same technology, and the products tested in the Rule 1.132 Declaration were not clearly shown to be the same products disclosed in Oltman.

In the Declaration by the Applicant under 37 CFR § 1.132 submitted herewith, a side-by-side comparison of the present invention, the invention disclosed by Oltman et al., and a tab system from a commercially available metal-air cell. All three tab systems include three

components: a overlaminate layer, a face stock layer and an adhesive layer. In each, the face stock layer is a 3-ply biaxially oriented polypropylene material, the adhesive layer is an acrylic adhesive, and the overlaminate layer is a plastic film. The Examiner asserted that the tab system disclosed by Oltman et al. inherently has the same loss stiffness, oxygen permeability and peel strength as the present invention is that the Oltman et al. tab system appears to be substantially identical to the tab system of the present invention, since both have a first polymer layer (the face stock layer) applied to the cell via an acrylic adhesive. Using the same rationale, there would be a reasonable expectation that tab system from the commercially available Rayovac brand product would have the same loss stiffness, oxygen permeability and peel strength as the tab systems of both the present invention and the product disclosed by Oltman et al. because all three tab systems appear to be substantially identical with regard to the 3-ply biaxially oriented polypropylene face stock layer, the acrylic adhesive layer and the plastic film overlaminate layer. As shown in Exhibit A, the loss stiffness, oxygen permeability and peel strength characteristics of the Rayovac brand battery tab system are different from those of the present invention, even though both have a 3-ply biaxially oriented polypropylene face stock layer, an acrylic adhesive layer and a plastic film overlaminate layer. Based on this comparison and the fact that the tab system disclosed by Oltman et al. also has a 3-ply biaxially oriented polypropylene face stock layer, an acrylic adhesive layer and a plastic film overlaminate layer, it is would not be reasonable to expect that the Oltman et al. tab system has the same loss stiffness, oxygen permeability and peel strength as the tab system of the present invention.

While the examples of plastic films disclosed by Oltman et al. (polyester and acetate) are not identical to the plastic film in the Rayovac brand tab system (polypropylene), the plastic film in the tab system disclosed by Oltman et al. can be another material besides polyester or acetate (dependent claim 5 specifies a plastic film selected from the group consisting of polyester film and acetate film). If the Oltman et al. tab system were considered not to be substantially identical to, and therefore not reasonably expected to have the same characteristics as, the Rayovac brand tab system because Oltman et al. do not explicitly disclose that the plastic film can be polypropylene, then the Oltman et al. tab system cannot be considered to be substantially identical to, with the same characteristics as, the tab system of the present invention.

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For the reasons presented above, the loss stiffness, oxygen permeability and peel strength characteristics of the tab system of the present invention are not inherent in the tab system disclosed by Oltman et al., either because the substantially identical Rayovac brand tab system has different characteristics, or because the tab system disclosed by Oltman et al. is not substantially identical to the tab system of the present invention.

Because the loss stiffness, oxygen permeability and peel strength are not disclosed or inherent in the tab system disclosed by Oltman et al., claims 1, 19, 23 and 29 are not anticipated by Oltman et al.

Claims 1, 19, 23 and 29 are also not obvious over Oltman et al. in view of WO '224. Oltman et al. do not teach that the cell comprises zero added mercury. WO '224 is drawn to zinc-air cells which employ a zinc active material and an electrolyte comprising KOH, and the cell also contains zero added mercury (page 2, lines 27-29). The Examiner asserted that because Oltman makes no mention of the presence of mercury in the product, it is not expected to have any mercury therein. The Examiner also asserted that it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Oltman by designing the cell to have zero added mercury, since mercury is hazardous to the environment and to the health of humans and animals and would have generated a battery which is compliant with the increased demand by the public and federal, state and local governments to substantially decrease or eliminate mercury in all electrochemical cells, including button-type cells. Applicants disagree for the reasons presented below.

The product disclosed by Oltman et al. contained added mercury, as shown in the Declaration by Robert B. Dopp, one of the co-inventors of the Oltman et al. reference. Furthermore, as stated in Mr. Dopp's declaration, one skilled in the art would have expected cells disclosed in a patent publication dated in the 1980's, when the Oltman et al. patent was issued and the corresponding application was filed, to contain added mercury unless otherwise disclosed because air cell batteries being made during the 1980's typically contained added mercury.

It would not have been obvious to modify the metal-air cell disclosed by Oltman et al. based on the teachings of WO '224 to arrive at the claimed cell comprising zero added mercury

and having a tab system with the loss stiffness, oxygen permeability and peel strength characteristics recited in claims 1, 19, 23 and 29. First, the prior art references do not teach or suggest all of the claim limitations, since the recited tab system characteristics are not disclosed or inherent in the references. Second, there is no suggestion or motivation in either the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the teachings of the references to arrive at the claimed invention.

Further evidence of the nonobviousness of the claimed invention is the fact that the problem solved by the invention and its source are not recognized in the Oltman et al. or WO '224 references. The present invention is more effective in preventing premature cell activation during storage, and the control of gas transmission through the tab system is more important due to the increased potential for gas generation in a cell containing no added mercury (page 2, line 29 to page 3, line 7). Premature cell activation during storage can result when pressure inside the cell causes the tab system to separate from the cathode can, allowing an excessive amount of oxygen to enter the cell (page 7, lines 5-19). The tab system is improved when it is more conformable to the external surface of the cell to which it is applied (i.e., a tab system having a loss stiffness from about 25,000 to less than about 55,000 N/m at 20-25°C) and will better manage the generation of gases inside the cell by controlling gas transmission through the tab system (i.e., a tab system having an oxygen permeability from about 50 to about 150 ($cm^3$ x m x mm Hg)/($m^2$ x day). This can be particularly important in a cell with no added mercury, which can generate more hydrogen gas than one using amalgamated zinc. A tab system that is less conformable and has a lower oxygen permeability than that of the present invention may perform satisfactorily on a cell containing mercury to minimize internal gassing but not on a cell with no added mercury. The problem and the inadequacy of tab systems that do not have a loss stiffness and oxygen permeability within the claimed ranges are not recognized by Oltman et al. or in the WO '224 reference.

The present invention, as defined in each of the independent claims, requires a tab system having a loss stiffness from about 25,000 to less than about 55,000 N/m at 20-25°C) and an oxygen permeability from about 50 to about 150 ($cm^3$ x m x mm Hg)/($m^2$ x day), as well as a cell

comprising zero added mercury. For the above reasons, Applicants believe that claims 1-3, 5, 6, 8-20, 22-24, 26-29, 31 and 32 are not obvious over Oltman et al. in view of WO 01/91224.

In the previous Office Action, dated October 26, 2006, claims 3, 20 and 24 were rejected under 35 USC § 112, second paragraph. Claims 3, 20 and 24 recite that the external surface of the cell having at least one air entry port comprises a curved surface. In the Office Action dated October 6, 2006, the Examiner indicated that these claims had been interpreted in light of the specification such that the curved surface as claimed is not the surface which includes the air entry ports, but rather the sidewall of the cell, because it was apparent from the drawings and disclosure that the air entry ports are formed on the lower, planar surface of the cell (as shown in Figs. 1 and 2), not on the curved surface of the cell. Based on this interpretation, claims 3, 20 and 24 were rejected under 35 USC § 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. This interpretation was repeated in the Office Action dated March 19, 2007. However, in the paper submitted on March 5, 2007, a revision to Figs. 1 and 2 was requested, showing the lower surface of the cell, on which the air entry port(s) are disposed, to be curved rather than planar. The revision was approved by the Examiner, and the § 112, second paragraph rejection withdrawn, in the Office Action dated March 19, 2007. The Examiner has not provided any reasons for maintaining the rejection of claims 3, 20 and 24 under § 112, second paragraph. Applicants believe that the original rejection was overcome by the amendment to the drawings submitted on March 5, 2007, and that the rejection was inadvertently repeated in the latest Office Action.

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For the reasons set forth above, Applicants believe that the application is in condition for allowance. Withdrawal of the rejections and allowance of claims 1-3, 5, 6, 8-20, 22-24, 26-29, 31 and 32 are requested.

Respectfully submitted,

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